

## CLIMATE AND CROP SERVICE.

By JAMES BERRY, Chief of Climate and Crop Service Division.

The following extracts relating to the general weather conditions in the several States and Territories are taken from the monthly reports of the respective sections of the Climate and Crop Service. The name of the section director is given after each summary.

Rainfall is expressed in inches.

**Alabama.**—The mean temperature was 44.6°, or nearly normal; the highest was 75°, at Mount Willing on the 10th, and the lowest, 10°, at Newburg on the 1st and at Madison on the 31st. The average precipitation was 5.64, or 0.40 above normal; the greatest monthly amount, 9.97, occurred at Newton, and the least, 1.66, at Livingston.—*F. P. Chaffee.*

**Arizona.**—The mean temperature was 43.5°, or 0.6° below normal; the highest was 88°, at Maricopa on the 24th and at Signal on the 28th, and the lowest, 12° below zero, at Fort Defiance on the 1st. The average precipitation was 1.01, or 0.03 above normal; the greatest monthly amount, 2.35, occurred at Oracle, and the least, 0.02, at Blaisdell.—*W. G. Burns.*

**Arkansas.**—The mean temperature was 39.3°, or 0.5° above normal; the highest was 75°, at Blanchard on the 13th, and the lowest, 9° below zero, at Corning on the 31st. The average precipitation was 5.91, or 1.48 above normal; the greatest monthly amount, 11.19, occurred at Lonoke, and the least, 1.58, at Winslow.—*E. B. Richards.*

**California.**—The mean temperature for the State, obtained by weighting the reports from 246 stations, so that equal areas have about equal weight, was 46.4°, or 2.4° above normal; the highest was 91°, at Hill Ranch, San Luis Obispo County, on the 29th, and the lowest, 17° below zero, at Bodie, Mono County, on the 13th. The average precipitation was 3.53, or 0.50 above normal; the greatest monthly amount, 20.83, occurred at Fort Ross, Sonoma County, while none fell at Volcano Springs, San Diego County.—*W. H. Hummon.*

**Colorado.**—The mean temperature was 22.7°, or 1.9° below normal; the highest was 63°, at Leroy on the 3d, and the lowest, 36° below zero, at Gunnison on the 14th. The average precipitation was 0.78, or 0.17 below normal; the greatest monthly amount, 5.19, occurred at Ruby, and the least, trace, at Garnett.—*F. H. Brandenburg.*

**Florida.**—The mean temperature was 59.2°, or nearly normal; the highest was 88°, at Bartow on the 6th, at Manatee on the 15th, and at Boca Raton on the 16th; the lowest was 25°, at Defuniak Springs on the 29th. The average precipitation was 4.53, or 1.50 above normal; the greatest monthly amount, 8.71, occurred at Earnestville, and the least, 1.00, at Carrabelle.—*A. J. Mitchell.*

**Georgia.**—The mean temperature was 45.4°, or 0.4° above normal; the highest was 79°, at Jessup on the 6th, and the lowest, 15°, at Diamond on the 1st, 2d, 7th, and 8th, at Ramsey on the 2d, and at Tallapoosa on the 31st. The average precipitation was 4.96, or 0.37 above normal; the greatest monthly amount, 8.06, occurred at Covington, and the least, 3.20, at Piscataway.—*J. B. Marbury.*

**Illinois.**—The mean temperature was 26.3°, or about 1.0° above normal; the highest was 64°, at Cairo on the 4th, and the lowest, 21° below zero, at Lanark on the 29th and 31st and at Scales Mound on the 31st. The average precipitation was 1.86, or 0.65 below normal; the greatest monthly amount, 7.78, occurred at Raum, and the least, 0.24, at Galva and Savanna.—*C. E. Linney.*

**Indiana.**—The mean temperature was 28.6°, or 1.9° above normal; the highest was 65°, at Washington on the 23d, and the lowest, 14° below zero, at Lafayette on the 29th and at Valparaiso on the 29th and 31st. The average precipitation was 3.23, or 0.16 above normal; the greatest monthly amount, 5.17, occurred at Marengo, and the least, 0.50, at Valparaiso.—*C. F. R. Wapenhans.*

**Iowa.**—The mean temperature was 19.8°, or several degrees above normal; the highest was 68°, at Council Bluffs on the 21st, and the lowest, 34° below zero, at Mason City on the 31st. The average precipitation was 0.28, or much below normal; the greatest monthly amount, 1.15, occurred at Eldora, and the least, trace, at several stations.—*G. M. Chappel.*

**Kansas.**—The mean temperature was 30.1°, or 1.4° below normal; the highest was 66°, at Cunningham and Fall River on the 21st, and at Englewood and Grenola on the 22d, and the lowest, 18° below zero, at Colby and Russell on the 31st. The average precipitation was 0.35, or 0.50 below normal; the greatest monthly amount, 1.20, occurred at Pittsburg, while none fell at Lebanon.—*T. B. Jennings.*

**Kentucky.**—The mean temperature was 34.4°, or nearly normal; the highest was 68°, at Marrowbone on the 4th, and the lowest, 18° below zero, at Loretto on the 31st. The average precipitation was 6.23, or 1.95 above normal; the greatest monthly amount, 8.22, occurred at Hopkinsville, and the least, 3.30, at Carrollton.—*H. B. Hersey.*

**Louisiana.**—The mean temperature was 49.9°, or 1.1° below normal; the highest was 82°, at Donaldsonville on the 4th and at Schriever on the 13th, and the lowest, 11°, at White Sulphur Springs on the 2d. The average precipitation was 6.43, or 1.59 above normal; the greatest monthly amount, 14.01, occurred at Jennings, and the least, 1.00, at Houma and Lawrence.—*A. G. McAdie.*

**Maryland and Delaware.**—The mean temperature was 32.9°, or 1.3° above normal; the highest was 70°, at Ocean City, Md., on the 15th, and the lowest, 24° below zero, at Sunnyside, Md., on the 2d. The average precipitation was 3.30, or 0.62 above normal; the greatest monthly amount, 6.59, occurred at Sunnyside, Md., and the least, 1.31, at Boettcherville, Md.—*F. J. Wals.*

**Michigan.**—The mean temperature was 19.1°, or 1.3° below normal; the highest was 56°, at Allegan on the 4th, and the lowest, 41° below zero, at Iron River on the 31st. The average precipitation was 1.79, or 0.57 below normal; the greatest monthly amount, 3.31, occurred at Thornville, and the least, 0.35, at Rogers City.—*C. F. Schneider.*

**Minnesota.**—The mean temperature was 9.9°, or about 1.0° above normal; the highest was 49°, at Pleasant Mounds on the 15th, and the lowest, 54° below zero, at Pokegama on the 29th. The average precipitation was 0.60, or about normal; the greatest monthly amount, 1.48, occurred at Glenwood, and the least, trace, at several stations.—*T. S. Outram.*

**Mississippi.**—The mean temperature was 45.2°, or nearly normal; the highest was 79°, at Natchez on the 4th, and the lowest, 1°, at Ripley on the 31st. The average precipitation was 7.77, or nearly 3.0 above normal; the greatest monthly amount, 13.25, occurred at Canton, and the least, 3.90, at Pearlinton.—*W. T. Blythe.*

**Missouri.**—The mean temperature was 30.3°, or 1.3° above normal; the highest was 70°, at Mount Vernon on the 22d, and the lowest, 21° below zero, at Pickering on the 29th. The average precipitation was 1.54, or 0.82 below normal; the greatest monthly amount, 12.61, occurred at New Madrid, and the least, 0.01, at Elmira.—*A. E. Hackett.*

**Montana.**—The mean temperature was 20.9°, or 1.1° above normal; the highest was 80°, at Parrot on the 18th, and the lowest, 45° below zero, at Fort Logan on the 4th. The average precipitation was 1.35, or 0.43 above normal; the greatest monthly amount, 3.60, occurred at Troy.—*E. J. Glass.*

**Nebraska.**—The mean temperature was 23.0°, or 3.1° above normal; the highest was 74°, at Fort Robinson on the 20th, and the lowest, 21° below zero, at Norfolk, Hartington, and Santee Agency on the 30th, and at Springfield on the 31st. The average precipitation was 0.24, or about 0.40 below normal; the greatest monthly amount, 1.50, occurred at Lodgepole, while none fell at several central and southwestern stations.—*G. A. Loveland.*

**Nevada.**—The mean temperature was 31.8°, or about 5.0° above normal; the highest was 65°, at Las Vegas on the 28th, and the lowest, 12° below zero, at Monitor Mill on the 13th. The average precipitation was 1.20, or about 1.15 below normal; the greatest monthly amount, 4.36, occurred at Verdi, and the least, trace, at Battle Mountain.—*J. H. Smith.*

**New England.**—The mean temperature was 22.3°, or 0.6° above normal; the highest was 59°, at Bennington, Vt., on the 5th, and the lowest, 32° below zero, at Fairfield, Me., on the 2d. The average precipitation was 3.59, or 0.29 below normal; the greatest monthly amount, 6.04, occurred at Narragansett Pier, R. I., and the least, 1.12, at Burlington, Vt.—*J. W. Smith.*

**New Jersey.**—The mean temperature was 30.1°, or 0.3° above normal; the highest was 60°, at Moorestown on the 5th, and the lowest, 21° below zero, at Rivervale on the 2d. The average precipitation was 4.01, or 0.21 above normal; the greatest monthly amount, 5.73, occurred at Rivervale, and the least, 2.40, at Atlantic City.—*E. W. McGann.*

**New Mexico.**—The mean temperature was 31.7°, or 1.4° below normal; the highest was 73°, at Eddy on the 22d, and the lowest, 21° below zero, at Buckmans on the 14th. The average precipitation was 0.34, or 0.24 below normal; the greatest monthly amount, 2.80, occurred at Fort Wingate, while none fell at Eddy, Galisteo, Hillsboro, and San Marcial.—*R. M. Harding.*

**New York.**—The mean temperature was 23.0°, or 0.1° below normal; the highest was 62°, at Bolivar on the 5th, and the lowest, 35° below zero, at Saranac Lake on the 10th. The average precipitation was 2.42, or 0.50 below normal; the greatest monthly amount, 5.90, occurred at Kings Station, and the least, 0.40, at Fleming.—*R. G. Allen.*

**North Carolina.**—The mean temperature was 40.5°, or nearly normal; the highest was 77°, at Tarboro on the 6th, and the lowest, 5°, at Roxboro on the 2d. The average precipitation was 4.00, or slightly below normal; the greatest monthly amount, 7.44, occurred at Oakridge, and the least, 1.98, at Biltmore.—*C. F. von Herrmann.*

**North Dakota.**—The mean temperature was 6.2°, or 3.0° above normal; the highest was 55°, at Berthold Agency on the 22d, and the lowest, 41°

below zero, at Hamilton on the 30th. The average precipitation was 0.29, or 0.30 below normal; the greatest monthly amount, 0.78, occurred at Forman, and the least, trace, at Ashley, Coal Harbor, Ellendale, Glenullin, Larimore, and Steele.—*B. H. Bronson.*

*Ohio.*—The mean temperature was 27.8°, or nearly normal; the highest was 66°, at Portsmouth on the 4th, and the lowest, 15° below zero, at Colebrook and Garrettsville on the 31st. The average precipitation was 3.01, or nearly normal; the greatest monthly amount, 6.53, occurred at Hanging Rock, and the least, 1.44, at Annapolis.—*J. Warren Smith.*

*Oregon.*—The mean temperature was 38.6°, or 3.6° above normal; the highest was 78°, at Langlois on the 25th, and the lowest, 10° below zero, at Weston on the 3d. The average precipitation was 6.49, or 0.37 above normal; the greatest monthly amount, 30.08, occurred at Glenora, and the least, 0.23, at Prineville.—*B. S. Pague.*

*Pennsylvania.*—The mean temperature was 26.6°, or 1.4° below normal; the highest was 66°, at Pittsburg on the 4th, and at Lycippus on the 5th, and the lowest, 21° below zero, at Dushore on the 2d. The average precipitation was 3.05, or 0.15 below normal; the greatest monthly amount, 4.84, occurred at Browers Lock, and the least, 0.82, at Franklin.—*T. F. Townsend.*

*South Carolina.*—The mean temperature was 44.4°, or 1.6° below normal; the highest was 78°, at Gillisonville on the 6th, and the lowest, 17°, at Little Mountain on the 2d and at Walhalla on the 7th. The average precipitation was 4.72, or 0.37 above normal; the greatest monthly amount, 6.75, occurred at Holland, and the least, 2.84 at Charleston.—*J. W. Bauer.*

*South Dakota.*—The mean temperature was 15.0°, or about 4.0° above normal; the highest was 68°, at Desmet on the 24th, and the lowest, 32° below zero, at Wessington Springs on the 30th. The average precipitation was 0.40, or 0.28 below normal; the greatest monthly amount, 2.65, occurred at Rochford, and the least, trace, at Forestburg, Gannvalley, and Wessington Springs.—*S. W. Glenn.*

*Tennessee.*—The mean temperature was 38.3°, or slightly above normal; the highest was 72°, at Jackson on the 4th, and the lowest, 2° below zero, at Madison on the 31st. The average precipitation was 6.02, or nearly 1.00 above normal; the greatest monthly amount, 8.75, occurred at Union City, and the least, 2.06, at Silverlake.—*H. C. Bate.*

*Texas.*—The mean temperature for the State, determined by comparison of 41 stations, well distributed throughout the State, was 1.8° below the normal; the temperature was nearly normal along the coast,

while there was a general deficiency over the interior; maximum, 91° at Fort Ringgold on the 21st; minimum, 3° below zero at Amarillo on the 31st. The average precipitation for the State, determined by comparison of 51 stations, distributed throughout the State, was 0.32 below the normal; there was a deficiency ranging from 1.00 to 2.38 over central Texas, the eastern portion of southwest Texas and the extreme western portion of the coast district, while there was an excess generally elsewhere, which, however, was light except along the east coast, where the excess ranged from 1.83 to 6.70, the greatest being at Galveston. The rainfall at Galveston, 10.39, is the heaviest on record for the month of January since the opening of the station in 1871. The weather was generally favorable for wheat. Too much rain over the east coast injured strawberry plants and retarded garden work.—*I. M. Cline.*

*Utah.*—The mean temperature was 27.7°; the highest was 70°, at St. George on the 27th, and the lowest, 21° below zero, at Woodruff on the 10th. The average precipitation was 1.14; the greatest monthly amount, 3.96, occurred at Huntsville, and the least, 0.10, at Frisco and Grove.—*L. H. Murdoch.*

*Virginia.*—The mean temperature was 35.5°, or 1.4° below normal; the highest was 75°, at Sunbeam on the 6th, and the lowest, 12° below zero, at Woodstock on the 2d. The average precipitation was 3.36, or 1.02 below normal; the greatest monthly amount, 5.34, occurred at Warrenton, and the least, 1.31, at Stephens City.—*E. A. Evans.*

*Washington.*—The mean temperature was 34.4°, or nearly normal; the highest was 66°, at Waterville on the 27th, and the lowest, 36° below zero, at Usk on the 6th. The average precipitation was 7.36, or about 2.00 above normal; the greatest monthly amount, 24.28, occurred at Clearwater, and the least, 1.29, at Loomis.—*G. N. Salisbury.*

*Wisconsin.*—The mean temperature was 13.9°, or nearly normal; the highest was 52°, at Prairie du Chien on the 26th, and the lowest, 46° below zero, at Osceola on the 29th. The average precipitation was 0.86, or 0.23 below normal; the greatest monthly amount, 1.70, occurred at Shawano, and the least, 0.15, at Brodhead.—*W. M. Wilson.*

*Wyoming.*—The mean temperature was 22.7°, or slightly above normal; the highest was 60°, at Hecla on the 10th and at Sundance on the 13th and 18th, and the lowest was 21° below zero, at Sheridan on the 5th. The average precipitation was 1.50, or about 0.75 above normal; the greatest monthly amount, 6.40, occurred at Sherman, and the least, 0.10, at Wamsutter.—*W. S. Palmer.*

## SPECIAL CONTRIBUTIONS.

### LIST OF RECENT TITLES OF PAPERS BEARING ON METEOROLOGY.

W. F. R. PHILLIPS, in charge of Library, etc.

The subjoined list of titles has been selected from the contents of the periodicals and serials recently received in the library of the Weather Bureau. The titles selected are of papers or other communications bearing on meteorology or cognate branches of science. This is not a complete index of the meteorological contents of all the journals from which it has been compiled; it shows only the articles that appear to the compiler likely to be of particular interest in connection with the work of the Weather Bureau:

*Naturwissenschaftliche Rundschau, Braunschweig, 14 Jahrgang.*

Trabert, Wilh. Der Zusammenhang zwischen den Erscheinungen des Erdmagnetismus und den elektrischen Vorgängen in der Atmosphäre, p. 41. [From Metl. Zeit.]

*Comptes Rendus, Paris, Tome 128.*

Berthelot. Sur la marche générale de la végétation; plante développée à l'ombre et au soleil; regain. p. 139.

Poincaré, M. A. Mouvements barométriques sur l'orthogonal du méridien de la Lune, p. 328.

Tillo, A. de. Résultats des observations météorologiques faites dans la dépression au centre du continent asiatique, (station Lukishoun). p. 154.

Voielland, M. Chute de grêle et trombe observées à Bizerte. p. 327.

*Nature, London, Vol. 59.*

MacMahon, P. A. Mirage. p. 259.

*Das Wetter, Berlin, Jan. 1899.*

Arendt, Theodor. Ueber die Zunahme der Blitzgefahr. p. 1. — Zum Polarlicht, vom 9, September, 1898. p. 20.

Mienardus, Wilh. Der mitteleuropäische Winter und seine Beziehungen zum Golfstrom. p. 8.

Plumandon, J. R. Der Regen. p. 14. [From Ciel et Terre.]

*Petermann's Mitteilungen, Gotha, 45 Band.*

Supan, A. Vertikale Temperaturabnahme in der freien Atmosphäre. p. 19.

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*Ciel et Terre, Bruxelles, 19me. année.*

Bentley, W. A., Perkins, G. H. Les cristaux de la neige. p. 543. [From Appletons Popular Science Monthly.]

Lancaster, A. La gelée et les anticyclones. p. 579.

Moye, M. Les étoiles filantes et la météorologie. p. 526.

Ramsey, A. La théorie cinétique des gaz et quelques-unes de ses conséquences. p. 513, also p. 571.

St. Hepites. Météorologie de l'Etna. p. 563.

*Annales de Géographie, Paris, 1899.*

Martonne, E. de. Sur un nouveau mode de représentation du régime des pluies dans les contrées intertropicales. p. 84.

*Appleton's Popular Science Monthly, New York, Vol. 54.*

Smith, Stephen. Vegetation a Remedy for the Summer Heat of Cities. p. 433.

*National Geographic Magazine, Washington, Vol. 10.*

Garriott, E. B. West India Hurricane of September 10-11, 1898. p. 17.

*Philosophical Magazine, London, Vol. 47.*

van Rijckevorsel. On the Analogy of some Irregularities in the Yearly Range of Meteorological and Magnetic Phenomena. p. 57.

*Journal of School Geography, Lancaster, Vol. 3.*

Fenneman, N. M. Climate of the Great Plains. p. 1, also p. 46.

*Aeronautical Journal, London, Vol. 3.*

Eddy, W. A. Some Kite Records in the United States. p. 15.

Hazen, H. A. Glaisher's Highest Balloon Ascension. p. 13.

Rotch, A. L. Progress in the Exploration of the Air with Kites at the Blue Hill Observatory. p. 17.

*Scottish Geographical Magazine, Edinburgh, Vol. 14.*

Newell, F. H. The Hydrography of the United States. p. 9.

*Engineering News, New York, Vol. 41.*

— The Mississippi River Floods and Methods for their Control. 5. 50. [Abstract of report of the Committee on Commerce, U. S. Senate.]

Lippincott, J. B. Low Water Measurements in the State of California during the Summer of 1898. p. 12.

## HINTS TO OBSERVERS OF SHOOTING STARS.

By WILLIAM HARKNESS, Professor, U. S. Navy.

The star showers of November and other months attract